

Installing the hardware

This section includes information on installing a Meridian Companion system. Installation should proceed in the following order:

- install Base Stations and Base Station plug-top power supplies
- install remote power interconnect units
- install external antennas and lightning surge arrestors
- install a Companion Administration Terminal
- install a Remote Access Device
- wire the Time Compression Multiplexing lines
- install Meridian Companion cards

Note: If you plan to use Companion Manager instead of or in addition to the Administration Terminal, refer to *Companion Manager Installation and Operations Guide*.

Installing Base Stations and Base Station plug-top power supplies

Before installing a Base Station, verify the position as documented in the *Meridian Companion Programming and Provisioning Record*.

Installation guidelines

ATTENTION!

Each Base Station must be installed within 4,000 ft (TCM wiring length) of the Meridian Companion system.

Consider the following points when installing Base Stations or Base Station plug-top power supplies:

- Ensure that the installation complies with your local electrical code.
- Install Base Stations indoors where there is no condensation and the temperature remains between 32°F and 120°F, preferably between 60°F and 95°F.
- Install all Base Stations within 4,000 ft (wiring length) of the Meridian 1 system.
- Do not position Base Stations on large concrete or marble columns. Base Stations must be at least 40 in. from such columns. Locate all Base Stations at a cell center on the same side of such columns.
- Position Base Stations on ceilings, or upright against walls close to the ceiling on surfaces with the same material composition.
- Allow a clearance of at least 3½ in. between the Base Stations and surrounding objects, excluding other Base Stations (see Figure 2 on page 14).
- Position all the Base Stations at the same cell center a minimum of 54 in. apart, from the center of one Base Station to the center of another (see Figure 2 on page 14).
- Do not mount Base Stations in rows.

- If there are one or two Base Stations at the cell center you can install the Base Stations upright on a wall or on a ceiling.
- If there are three or four Base Stations at the cell center, install them on the ceiling.
- Do not position Base Stations in ducts, plenums, or hollow spaces used to transport environmental air.
- Position Base Stations away from where a portable is used in an office area by at least the amount shown in Table 1. Installing the Base Stations on ceilings or high on walls helps to maintain these minimum distances.

Table 1: Minimum distance between office areas and Base Stations

Number of Base Stations in the cell	Minimum distance between office areas and Base Stations
1	40 in.
2	56 in.
3	72 in.
4	80 in.

- Position the Base Station within 12 ft of an ac outlet, since the plug-top power supply has a 12-ft cord. Keep these points in mind:
 - the power supply must be located in an area accessible to a properly grounded ac outlet
 - the input plug is part of the power supply (the only way to remove power is to disconnect the power supply)
 - if you must install a new ac outlet to accommodate the power supply, ensure that the ac outlet is mounted with sufficient clearance to plug the power supply
 - if more than one Base Station is installed at a cell center, ensure that each plug-top power supply has a separate ac outlet

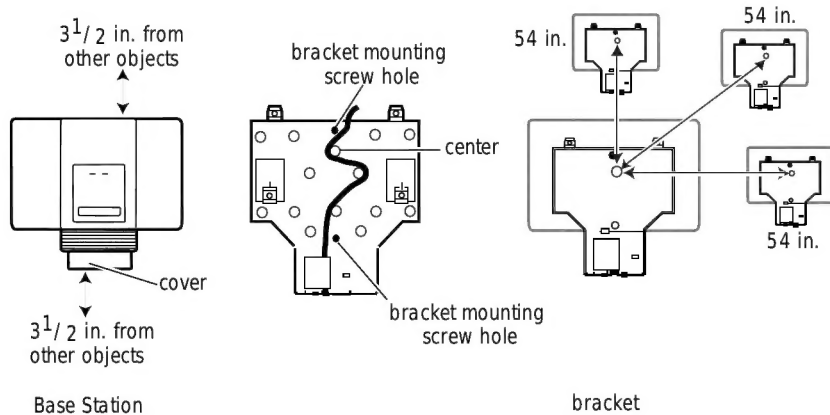
Powering a Base Station

Base Stations can be powered by plug-top power supplies or remote power interconnect units. See “Installing remote power interconnect units” or “Mounting a Base Station plug-top power supply” for your configuration.

Mounting a Base Station

Base Stations can be mounted on a wall or on a ceiling (when mounting on a wall, install it with the cover at the bottom, as shown in Figure 9 on page 21). Allow for the following clearance around the Base Station.

Figure 2: Clearance for the Base Station



Mounting a Base Station

1. Fasten the bracket into position using two #8 1 1/2-in. screws.
2. Route the telephone cable from the distribution block through the top (or bottom) opening.
3. Wind any excess telephone cable around the posts to secure it, then fasten it under the strain relief.
4. Connect the cable wires to the BIX connector on the termination board as shown in Figure 4 on page 16.

Figure 3: Base Station mounting bracket detail

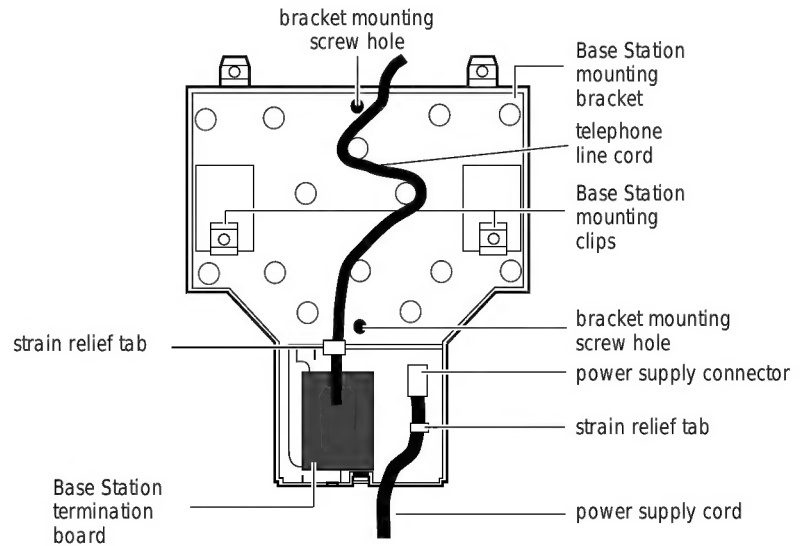
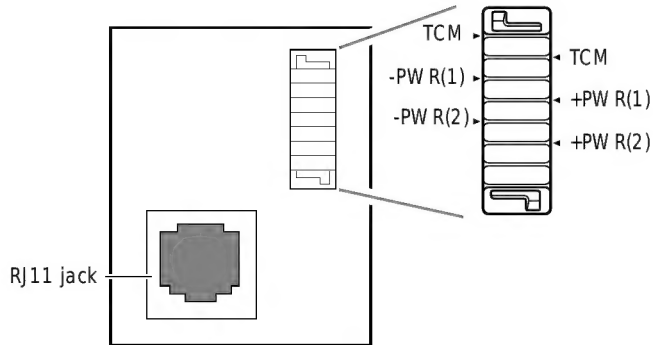


Figure 4: Termination board



CAUTION!

Use UL approved primary and secondary lightning surge arrestors in series when installing TCM wiring outdoors.

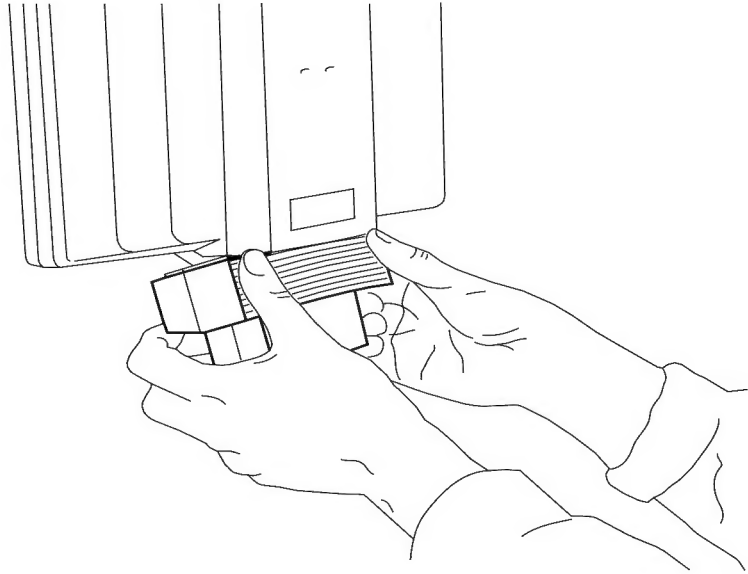
Any UL approved primary lightning surge arrestor may be used, but only an Oneac model 6-DP or ITW model MP1A-90-27 secondary lightning surge arrestor may be used.

5. Mount the Base Station onto the bracket, snapping it into position.
6. Connect the power RJ11 jumper lead to the RJ11 jacks on the termination board and the Base Station.
7. Record the associated port number in the space provided on the printed label affixed on the lower right corner of the mounting bracket.

Note: Include the labeling information for each Base Station on the completed installation floor plans and the *Meridian Companion Programming and Provisioning Record* for reference.

8. Slide the cover onto the bracket, using the guide to position it properly. Snap the cover into place.

Figure 5: Sliding cover onto bracket



Installing remote power interconnect units

Figures 6 and 7 illustrate two possible configuration options using a remote power interconnect (RPI) unit.

Figure 6 shows a configuration that is appropriate for a small installation where there is no main distribution frame (MDF). In this case, the RPI MDF capabilities provide the connections between the Meridian 1 system, Base Station power, and Base Stations. Essentially, the RPI unit functions as a distribution panel. This configuration can also be used if the existing MDF is full or if the customer wants to keep the wiring separate from the other telephone set wiring.

Note: The polarity of the TCM connections is not important. If *two* power pairs are brought in, they must be connected with the *same polarity* to the termination board.

WARNING!
When using two power pairs, ensure they are connected with the same polarity.

Figure 6: Base Station powering: RPI configuration option 1

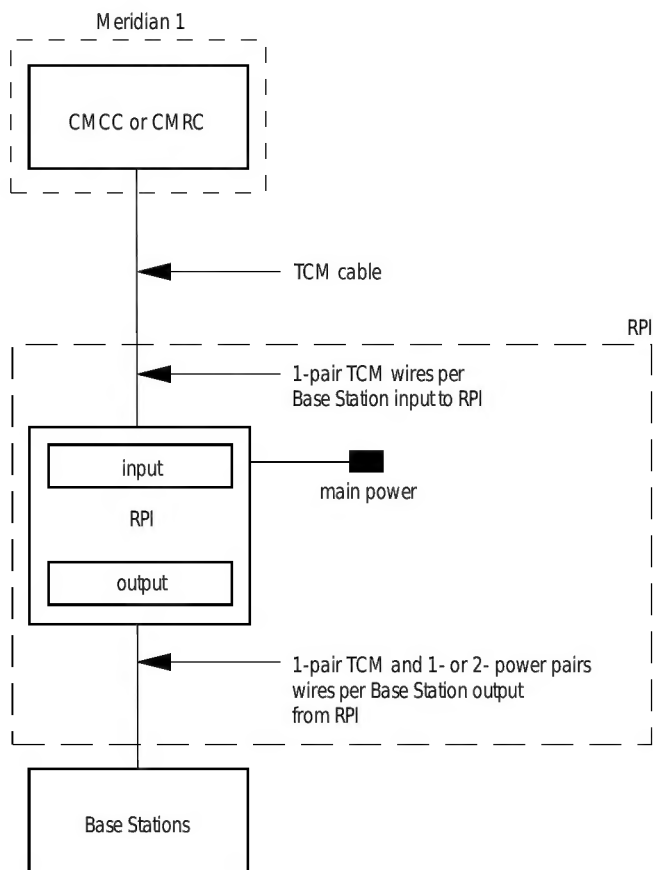
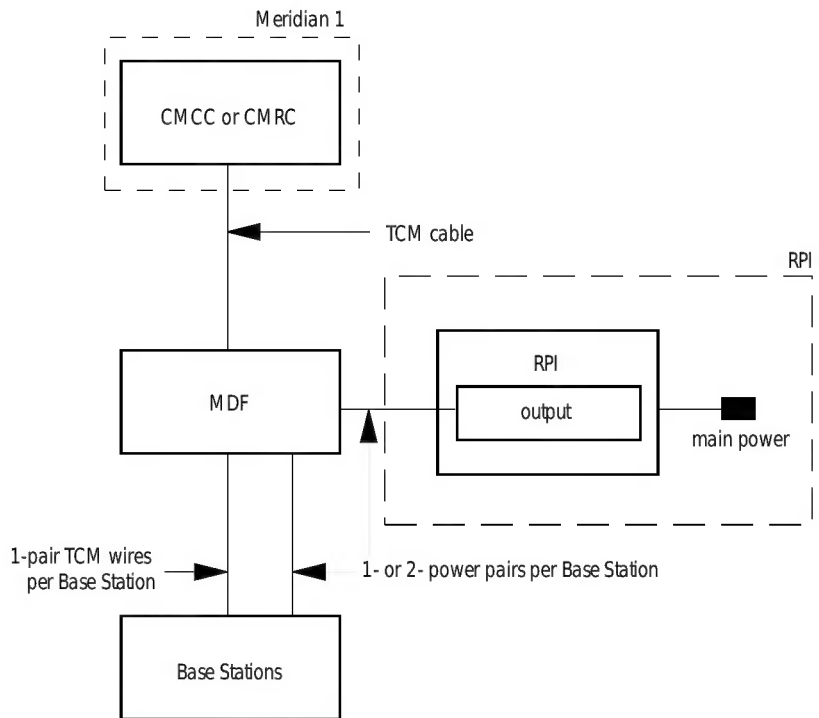


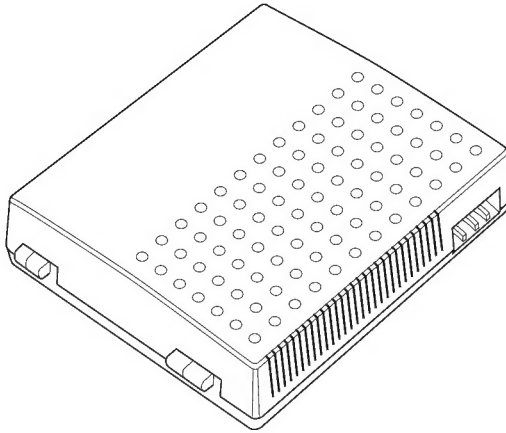
Figure 7 shows a configuration that would be suitable for a system that has an existing MDF. Typically the MDF is located in the same room as the Meridian 1 system, although it could be a closet MDF. In either case the Base Stations are wired through the MDF rather than the RPI unit.

Figure 7: Base Station powering: RPI configuration option 2



An illustration of an RPI unit appears in Figure 8. Figure 9 illustrates RPI components.

Figure 8: RPI unit



ATTENTION!

The RPI unit should have the dc backup power supplied by a UL listed UPS.

The UPS should have an output voltage rating of 44 to 50 V dc, with a maximum fault current limit of 6 A to protect the RPI's output wiring. Otherwise, it may be necessary to use class 1 wiring.

ATTENTION!

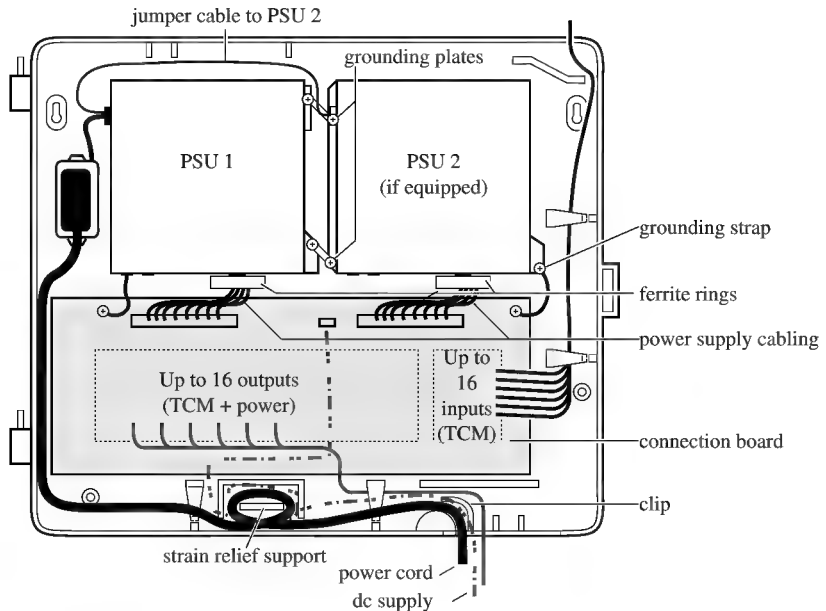
The RPI units must always be installed inside a building.

The ac outlet powering the RPI unit should be installed near the equipment and should be easily accessible.

The length of the RPI cord, from the outside surface of the unit to the plug, should be a minimum of 4 1/2 ft and a maximum of 15 ft.

ATTENTION!

An RPI unit should not be installed where its outputs are exposed, even when the Base Station is installed with the TCM lines exposed. An RPI unit should be installed in the same building as the Base Stations the RPI supports.

Figure 9: RPI components

There are two versions of the RPI unit: the RPI-8 BIX UL, which supports up to eight Base Stations; and the RPI-16 BIX UL, which supports up to 16 Base Stations. Each RPI has a connection board and either one (RPI-8 BIX UL) or two (RPI-16 BIX UL) power supply units. The maximum input power consumption of an RPI is 240 W. If a UPS 48 V dc backup source is used, the maximum input power requirement of the RPI is 140 W.

You can upgrade an RPI-8 BIX UL to an RPI-16 BIX UL by attaching a second power supply unit to the RPI-8 as described on page 29.

To determine the type and number of power supply units you need for a given number of Base Stations, use Table 2 on page 22.

Note: If RPIs are distributed throughout the site, the number and type of RPIs will depend on the placement and powering plan of the Base Stations.

Table 2: RPI requirements

Base Stations	Number of RPI-16 BIX UL and RPI-8 BIX UL required
1–8	1 RPI-8 BIX UL
9–16	1 RPI-16 BIX UL
17–24	1 RPI-16 BIX UL and 1 RPI-8 BIX UL
25–32	2 RPI-16 BIX UL
33–40	2 RPI-16 BIX UL and 1 RPI-8 BIX UL
41–48	3 RPI-16 BIX UL
49–56	3 RPI-16 BIX UL and 1 RPI-8 BIX UL
57–64	4 RPI-16 BIX UL
65–72	4 RPI-16 BIX UL and 1 RPI-8 BIX UL
73–80	5 RPI-16 BIX UL
81–88	5 RPI-16 BIX UL and 1 RPI-8 BIX UL
89–96	6 RPI-16 BIX UL
97–104	6 RPI-16 BIX UL and 1 RPI-8 BIX UL
105–112	7 RPI-16 BIX UL
113–120	7 RPI-16 BIX UL and 1 RPI-8 BIX UL
121–128	8 RPI-16 BIX UL

The system configuration dictates how many RPIs are required.

Installing an RPI unit

1. Mount the RPI as described in “Mounting the remote power interconnect unit” on page 23.
2. Wire the RPI as described in “Wiring the RPI unit” on page 25.

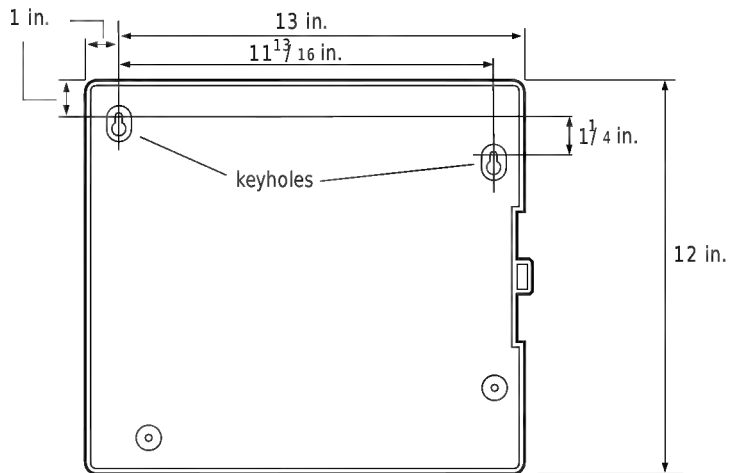
WARNING!

Do not power up the RPI until the installation is complete, including the installation of Base Station cross-connectors.

If you are adding extra lines for Base Stations, always power down the RPI before you begin.

Mounting the remote power interconnect unit

Figure 10: RPI mounting holes



Note: Mounting hardware is not supplied.

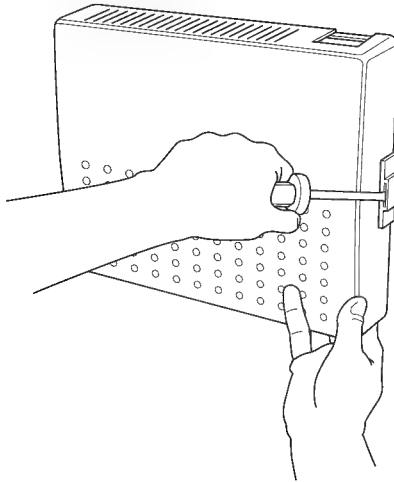
1. Position the screw holes for the RPI using the dimensions shown in Figure 10.

To provide adequate ventilation and to prevent overheating, leave a clearance of at least 5 in. around the RPI.

If mounting two RPIs, one above the other, leave a clearance of at least 1 ft between them to provide adequate ventilation and to prevent overheating.

2. Insert molly screws in the holes.
3. Partially screw in two #10 2-in. screws for the keyholes.
4. Open the hinged cover with a screwdriver by pushing in and then down to release the catch on the right side, as shown in Figure 11. You can remove the cover by taking it off its hinges.
5. Hang the RPI on the two keyhole screws and tighten them.
6. Install the remaining two screws.
7. Feed in the power cord through the bottom of the RPI and route it through the clip and around the strain relief support as shown in Figure 9.
8. Route the power cord to the input power jack just to the left of PSU 1. Connect the plug to the jack.

Note: Labeling RPIs distinctively may help with diagnosis if there are problems in the future.

Figure 11: Opening the RPI cover

Wiring the RPI unit

WARNING!

Do not run unprotected power cables outdoors.

The outputs of an RPI unit should not be wired so that its lines are exposed.

The maximum two-way (between the RPI and the Base Station) dc loop resistance for power pairs is *90 ohms*. Each Base Station needs one or two power pairs. The exact number depends on the wire size of the power pairs and the distance between the Base Station and the RPI. Table 3 shows the approximate maximum cabling distances. Remember that interconnections increase the loop resistance.

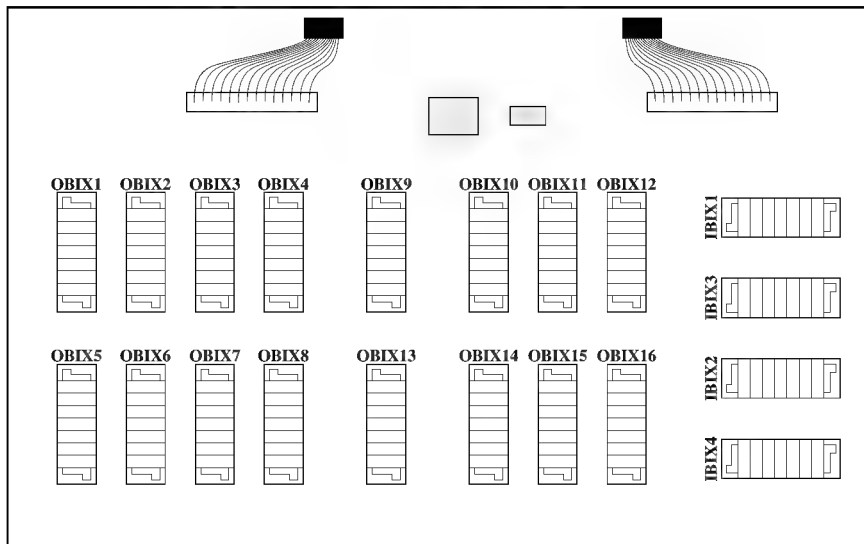
Table 3: Maximum cabling from RPI to Base Station

Wire size	Single-pair	Double-pair
22 AWG	1,500 ft	3,000 ft
24 AWG	1,000 ft	2,000 ft

WARNING!

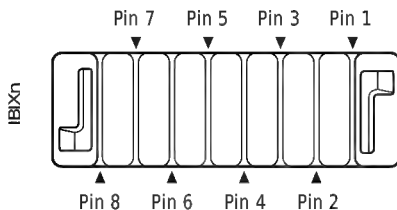
When using two power pairs, ensure they are connected with the same polarity.

Figure 12: RPI BIX connector board



Input connections

Figure 13: BIX input connector pinout



Wiring the RPI

1. Feed the TCM input pairs through the top of the RPI and route the pairs to the input connectors IBIX1 to IBIX4 as shown in Figure 12. There may be fewer than 16 input pairs in any RPI installation.

2. Connect the TCM pair for each Base Station to the appropriate TCM terminals. BIX connections are indicated in Table 4.

Table 4: Wiring connections

Input connector	Pin	Signal	Output connector
IBIX 1	1, 2	TCM 1	OBIX 1
	3, 4	TCM 2	OBIX2
	5, 6	TCM 3	OBIX3
	7, 8	TCM 4	OBIX4
IBIX2	1, 2	TCM 5	OBIX5
	3, 4	TCM 6	OBIX6
	5, 6	TCM 7	OBIX7
	7, 8	TCM 8	OBIX8
IBIX3	1, 2	TCM 9	OBIX9
	3, 4	TCM 10	OBIX10
	5, 6	TCM 11	OBIX11
	7, 8	TCM 12	OBIX12
IBIX4	1, 2	TCM 13	OBIX13
	3, 4	TCM 14	OBIX14
	5, 6	TCM 15	OBIX15
	7, 8	TCM 16	OBIX16

Output connections

3. Feed the TCM output pairs in through the bottom of the RPI as shown in Figure 12 (see Figure 14 for a close-up of the pinout connection) and route the pairs to the output connectors. If only one pair is used for powering a Base Station, connect the power pair to -PWR(1) and +PWR(1). If two pairs are used to power a Base Station, connect one

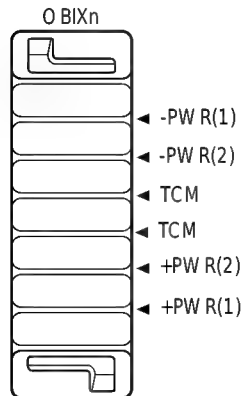
pair to -PWR(1) and +PWR(1), and the second pair to -PWR(2) and +PWR(2).

WARNING!

Ensure both power pairs have the same polarity.

Connecting two power pairs with opposing polarities may damage the Base Station and RPI.

Figure 14: BIX output connector pinout



4. Connect the dc power pair for each Base Station to the power terminals on the same connector as in “Upgrading an RPI-8 to an RPI-16.”

WARNING!

Do not power up the RPI until the installation is complete, including the installation of Base Station cross-connectors.

If you are adding extra lines for Base Stations, always power down the RPI before you begin.

Upgrading an RPI-8 to an RPI-16

ATTENTION!

Only distributors and authorized service personnel are permitted to upgrade an RPI-8.

The RPI-8 BIX UL, which has only one power supply unit, has grounding straps and plates fitted so it can be upgraded to an RPI-16 BIX UL (see Figure 9 on page 21).

1. Power down the RPI.
2. Unscrew the grounding straps and plates.
3. Add the second power supply unit and screw down the grounding straps, the grounding plates and the power supply unit.
4. Plug the output of the power supply unit into the connector board.
5. Connect the jumper lead from PSU 1 to the lead from PSU 2.
6. Power up the RPI.

Note: The dc power supply passes through the clip and strain relief support, as shown in Figure 9 on page 21, before connecting to the terminal block by 16 AWG wire.

ATTENTION!

The RPI unit should have the dc backup power supplied by a UL listed UPS.

The UPS should have an output voltage rating of 44 to 50 V dc, with a maximum fault current limit of 6 A to protect the RPI's output wiring. Otherwise, it may be necessary to use class 1 wiring.

Mounting a Base Station plug-top power supply

1. Fasten the bracket into position using two #8 1 $\frac{1}{2}$ -in. screws.
2. Route the power supply cord through the bottom (or top) opening and under the strain relief of the bracket.
3. Route the telephone cable from the distribution block through the top (or bottom) opening.
4. Wind any excess telephone cable around the posts to secure it, then fasten it under the strain relief.
5. Connect the cable wires to the BIX connector on the termination board as shown in Figure 4 on page 16.
6. Mount the Base Station onto the bracket, snapping it into position.
7. Connect the power RJ11 jumper lead to the RJ11 jacks on the termination board and the Base Station.
8. Connect the power supply connector to the Base Station power connector.

WARNING!

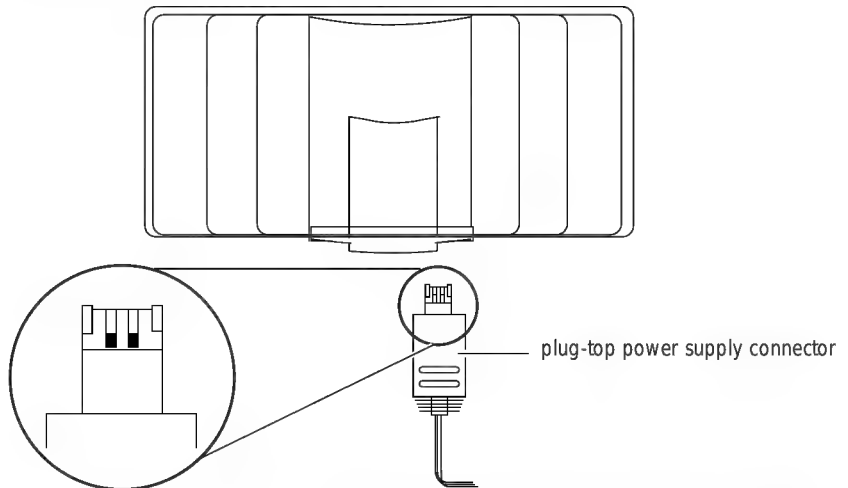
Inserting the power supply connector in the wrong direction may damage the plug-top power supply and the Base Stations.

Position the power supply connector in the proper direction and push it into place securely (see Figure 15).



CAUTION!

The Base Station should only be powered up with a class 2 plug-top power source.

Figure 15: Plug-top power supply connector

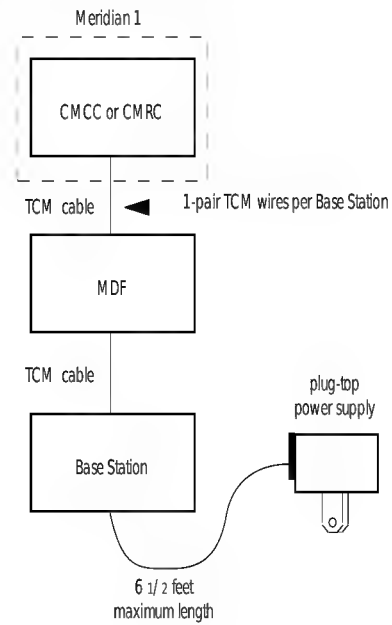
9. Plug the power supply into the ac outlet. The green light turns on and the red light flashes (if not, see “Troubleshooting a Base Station” on page 165).
10. Record the associated port number in the space provided on the printed label affixed on the lower right corner of the mounting bracket.

Note: Include the labeling information for each Base Station on the completed installation floor plans and the *Meridian Companion Programming and Provisioning Record* for reference.

11. Slide the cover onto the bracket, using the guide to position it properly. Snap the cover into place.

Figure 16 shows a configuration for small installations in which the Base Station is located near an existing ac power source or the Base Station is farther from an RPI unit than 3,000 ft.

Figure 16: Base Station local power



Installing external antennas and lightning surge arrestors

The following are requirements for installing external antennas and lightning surge arrestors:

- The antenna should always be mounted vertically (see Figure 17).
- Use #8 $\frac{1}{2}$ -in. to 2-in. screws to mount the antenna bracket and lightning surge arrestor bracket to the wall.
- Always ensure that the antenna is clear of any adjacent obstruction, particularly metal. If more than one external antenna is used at a cell center, they should be spaced at least *40 in.* from each other to avoid radio interference problems.
- When running the coaxial cable inside or outside, do not kink, stretch, or crush the cable. This will seriously affect its performance. The minimum recommended bending radius is 8 in.
- Depending on site requirements, a proprietary extension cable can be attached between the lightning surge arrestor and the antenna or between the lightning surge arrestor and the Base Station. The total cable length should always be kept as short as possible and the recommended extension cable used only if absolutely necessary.
- You must install a lightning surge arrestor for each outdoor external antenna.

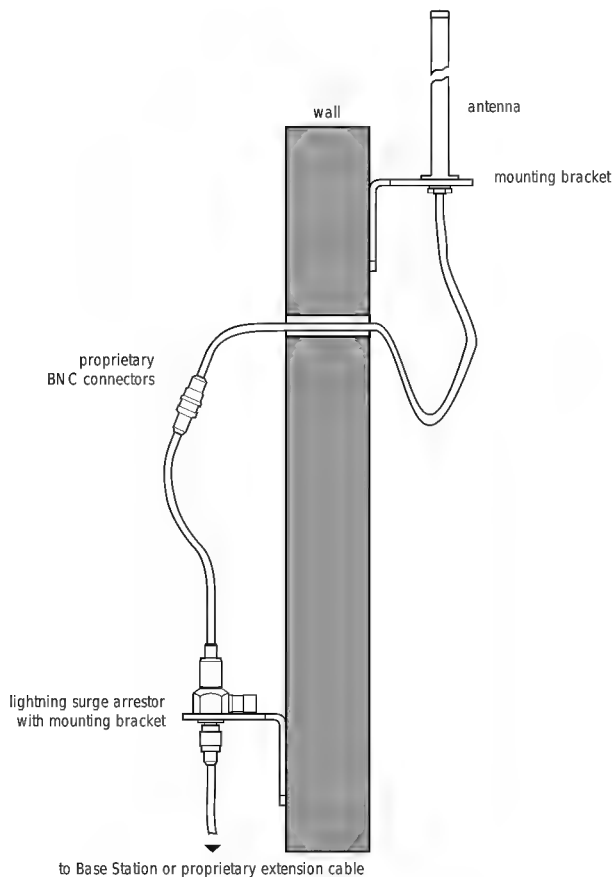
ATTENTION!

Do not install the external antenna or the lightning surge arrestor during an electrical storm.

Always turn off the Base Station power before connecting the coaxial cable of an outdoor external antenna.

Always install the lightning surge arrestor as close as possible to the cable entry point into the building.

Connect the lightning surge arrestor to ground before connecting the coaxial cable.



ATTENTION!

The FCC requires that only recommended antennas be connected to Base Stations.

Note: The external antenna connectors on the Base Station are special proprietary BNC connectors. Antennas are supplied with cables already attached and terminated with special proprietary BNC plugs to join with the connector on the Base Station.

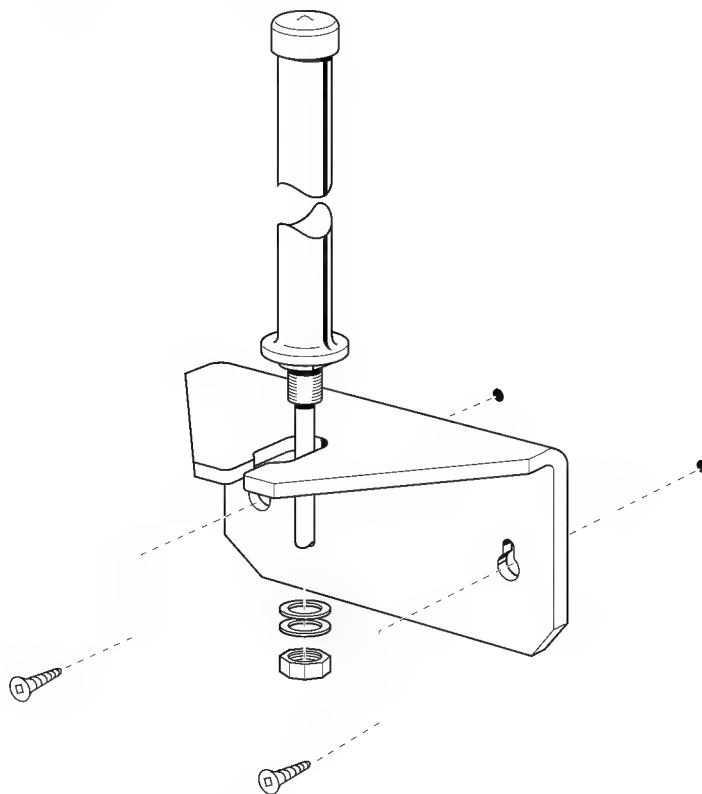
Planning for an outdoor external antenna

- Locate the antenna on the external wall of the building (see Figure 17).
- Keep the outdoor external antenna as close as possible to the Base Station serving it (the Base Station must be inside). The recommended mounting height is 13 to 16 ft above ground.
- Always install a lightning surge arrestor between an outdoor antenna and a Base Station.

Installing an outdoor external antenna

1. Drill a hole for the coaxial cable.
2. Install conduit for the antenna cable according to local building and wiring codes.
3. Screw the antenna bracket to the wall so the antenna will be positioned vertically on the exterior wall of the building (see Figure 18).
4. Loosen the nut on the antenna.
5. Slide the antenna into the slot of the bracket and tighten the nut.
6. Feed the coaxial cable through the wall to the lightning surge arrestor on the interior wall.

Figure 18: Antenna with antenna bracket

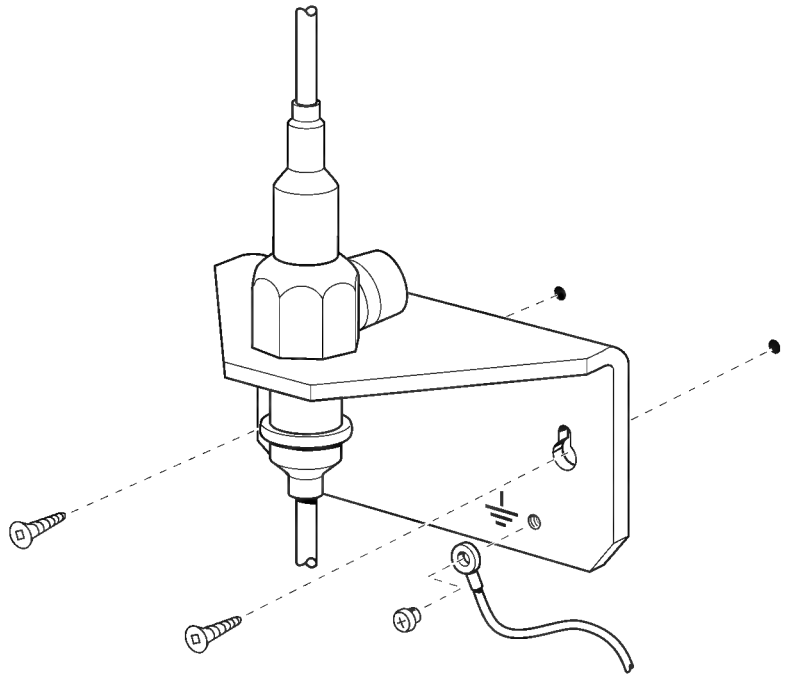


Installing a lightning surge arrester

Install the lightning surge arrester to protect the Meridian 1 system from electrical surges.

1. Mount the lightning surge arrester on the interior wall as close as possible to the entry point of the coaxial cable from the outdoor external antenna (see Figure 19).

Figure 19: Lightning surge arrester and bracket



2. Before you connect the ground lead to the lightning surge arrester, attach it to an approved ground.

The recommended wire gauge is 6 AWG. Connect the ground lead to the building ground. Do not connect to a ground rod or series of ground rods. If you cannot connect the ground lead to the building ground, connect it to the steel frame of the building. (The connection should be no more than 6 to 10 ft.)

You can also connect the ground lead to the 120 V ac conduit (which is connected to the building ground), but this is not a preferred installation.

Note: The connector between the antenna and the lightning surge arrestor and between the lightning surge arrestor and the Base Station is a proprietary BNC connector and requires alignment before a connection can be made.

3. Route and connect the coaxial cable from the outdoor external antenna to the lightning surge arrestor.
4. Route and connect the coaxial cable from the lightning surge arrestor to the appropriate Base Station connector.

Installing a Companion Administration Terminal

The Companion Administration Terminal is connected to the first Companion Meridian Controller card (CMCC) Time Compression Multiplexing (TCM) port. It cannot make or receive telephone calls, but is used to program the Meridian Companion system and the portable telephones.

Note: If you plan to use Companion Manager instead of or in addition to an Administration Terminal, refer to *Companion Manager Installation and Operations Guide*.

Installing the Administration Terminal

1. Remove the Administration Terminal from its box.
For wall mounting instructions, see “Mounting an Administration Terminal on the wall” on page 39.
2. Do not attach the receiver. (You may want to discard it because the Administration Terminal cannot be used as a telephone.)
3. Connect one end of the telephone cord to the back of the Administration Terminal and the other end to the port on the distribution block that corresponds to the first port on the CMCC.
4. Replace the four buttons below the display with the navigation button caps provided with the set.

Mounting an Administration Terminal on the wall

1. Remove the wall mounting bracket from the base of the Administration Terminal. Grip the base and, with both thumbs push up on the mounting bracket to pop it out.
2. Use a screwdriver or similar tool to remove the center knock-out panel from the base.
3. With the thin end up, hold the mounting bracket against the wall and mark the positions of the three fixing screws.
4. Route the line cord along the guide in the base and through the knocked out hole.
5. Screw the mounting bracket to the wall.
6. Connect the line cord to the jack in the base of the Administration Terminal.
7. Tuck the spare cable into the base.
8. Plug the Administration Terminal into the first port on the CMCC.
9. Snap the Administration Terminal onto the base.

Installing Companion Manager

You can use Companion Manager instead of or in addition to the Administration Terminal. For installation instructions, refer to *Companion Manager Installation and Operations Guide*. If you are running Companion Diagnostic Software (CDS) or Companion Manager on a PC, a Remote Access Device (RAD) must be installed.

Installing the PC Interface Card

The PCI card provides a physical connection between the Companion Controller and your PC. The PCI card communicates with the PC through an Input/Output port. This I/O port is a 16 byte area in PC memory between addresses 200 and 3F0(hex). The starting address of the I/O port is called the I/O base address.

The I/O base address and IRQ settings are in file `waccess.ini`, which is located in your windows root directory (usually `c:\windows`). On startup,

PCconfig backs up the existing `waccess.ini` file by renaming it `waccess.old`. If you have complex `waccess.ini` file contents (for example, TAPI or ACCESS), you should manually back up the file before running PCconfig.

The configuration tool verifies that the I/O base address and the IRQ selected for the PCI card are properly configured, and that the card is properly connected to the Controller.

Note: The configuration tool runs only on Windows 95® and Window 3.1®.

Setting the base address dip switches

The I/O base address is set using the five dip switches on the PCI card. You must select a setting that does not conflict with other hardware connected to your PC. If you are running Windows 95, you can view the I/O base address settings:

1. Press **START** and select **Settings/Control Panel**.
2. Double-click on the **System** icon to open the **System Properties**.
3. Select the **Device Manager** tab and press the **Properties** button.
4. Select the **Input/output** radio button.
5. Scroll through the list and ensure there is no conflict with the I/O addresses. Change the I/O base address settings on the card when there is a conflict.

You should initially set the dip switces to correspond to the I/O base address of 280h [ON,OFF,ON,ON,ON].

If you are running Windows 3.1 and you cannot view the I/O address settings, the best range of addresses is 230h to 300h.

Do not use 2F0h and 3F0h addresses. PC COMM1 AND COMM2 serial ports use addresses 2F8h and 3F8h.

On older PCI cards, the default dip switch settings correspond to I/O base address 300h. Address 300h may not work when you are running Windows 95.

Table 5: Dip switch settings

I/O address	1	2	3	4	5
200	ON	ON	ON	ON	ON
210	ON	ON	ON	ON	OFF
220	ON	ON	ON	OFF	ON
230	ON	ON	ON	OFF	OFF
240	ON	ON	OFF	ON	ON
250	ON	ON	OFF	ON	OFF
260	ON	ON	OFF	OFF	ON
270	ON	ON	OFF	OFF	OFF
280	ON	OFF	ON	ON	ON
290	ON	OFF	ON	ON	OFF
2A0	ON	OFF	ON	OFF	ON
2B0	ON	OFF	ON	OFF	OFF
2C0	ON	OFF	OFF	ON	ON
2D0	ON	OFF	OFF	ON	OFF
2E0	ON	OFF	OFF	OFF	ON
2F0	ON	OFF	OFF	OFF	OFF
300	OFF	Same as 200s section			
.	OFF				
.					
.					
3F0	OFF				

Installing the PCI card

ATTENTION!

Do not use a pencil to change the switch settings. Graphite deposits are electrically conductive and can cause a short circuit in the switch.

1. Set the five dip switches for the I/O base address you are using.
2. Power off the PC and remove the cover.
3. Insert the card in a free expansion slot.
4. Replace the cover.
5. Run a Teledapt cable from the card's LINE jack to the Controller.
6. Power up the PC.

Setting the hardware interrupt

The PCI card requires a hardware interrupt (IRQ) in the range of 3 to 7 that is not in use by another device on your PC.

Table 6: PC hardware and IRQ settings

IRQ	Use	
3	Serial port COMM2	may be available
4	Serial port COMM1	may be available
5	Sound card, LAN, ...	often available
6	Floppy drive controller	unavailable
7	Printer LPT1	often available

The configuration tool shows you the available IRQ settings, and allows you to choose the IRQ setting for the PCI card.

Note: Ensure that an IRQ setting is available before selecting it. If equipment connected to your PC is turned off, is not currently active, or if a driver is not running, the IRQ setting may appear as available.

For example, you may select IRQ7 for the PCI card, but a printer may be using IRQ7. You may not be able to print a file when the PCI application is active.

If an IRQ is not available in the range 3 to 7, you may be able to reconfigure equipment to use a higher IRQ setting. If you are running Windows 95, you can view the equipment and the IRQ setting:

1. Press START and select Settings/Control Panel.
2. Double-click on the System icon to open the System Properties.
3. Select the Device Manager tab and press the Properties button.
4. Select the Interrupt request radio button.

Note: Older equipment may not show up in this list.

For more information on installing the PCI card, refer to PCconfig on-line help.

Installing a Remote Access Device

Refer to *Companion Remote Access Device Installation Guide*.

RAD configuration options

The configuration in Figure 20 permits local or remote access to the Meridian Companion system.

Figure 20: Local or remote access to Meridian Companion

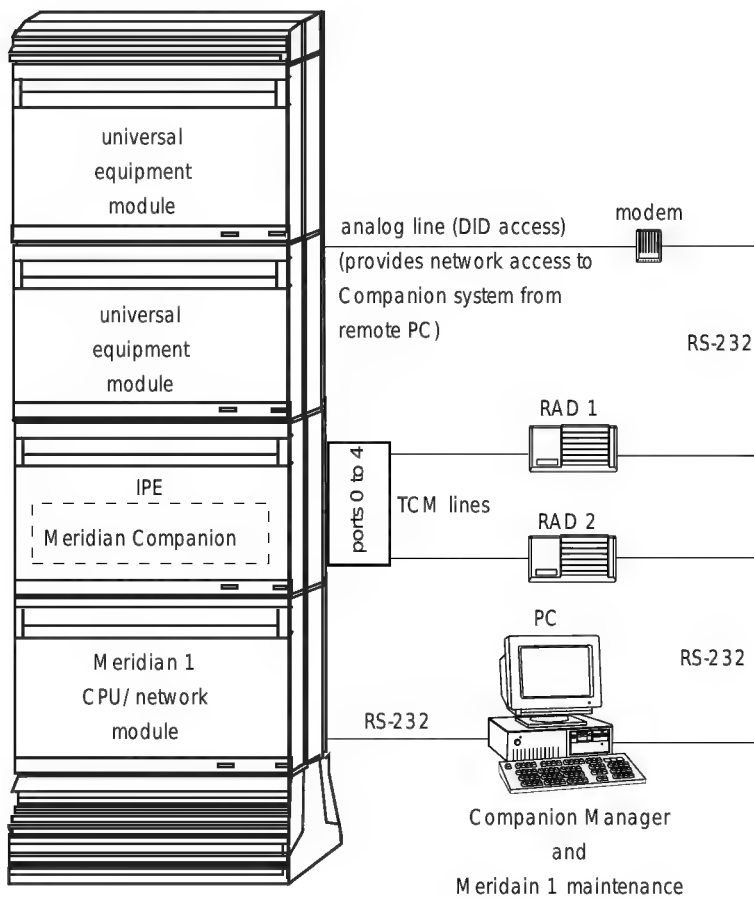


Figure 21 shows how to configure the PC when the PC handles Meridian 1 maintenance as well as Meridian Companion diagnostic software. The PC connects directly to the Meridian 1 system and connects to Companion through the RAD. In this configuration, the PC must have three serial ports to support the RAD, the mouse, and the Meridian 1 CPU.

Figure 21: Local access to shared Meridian Companion PC

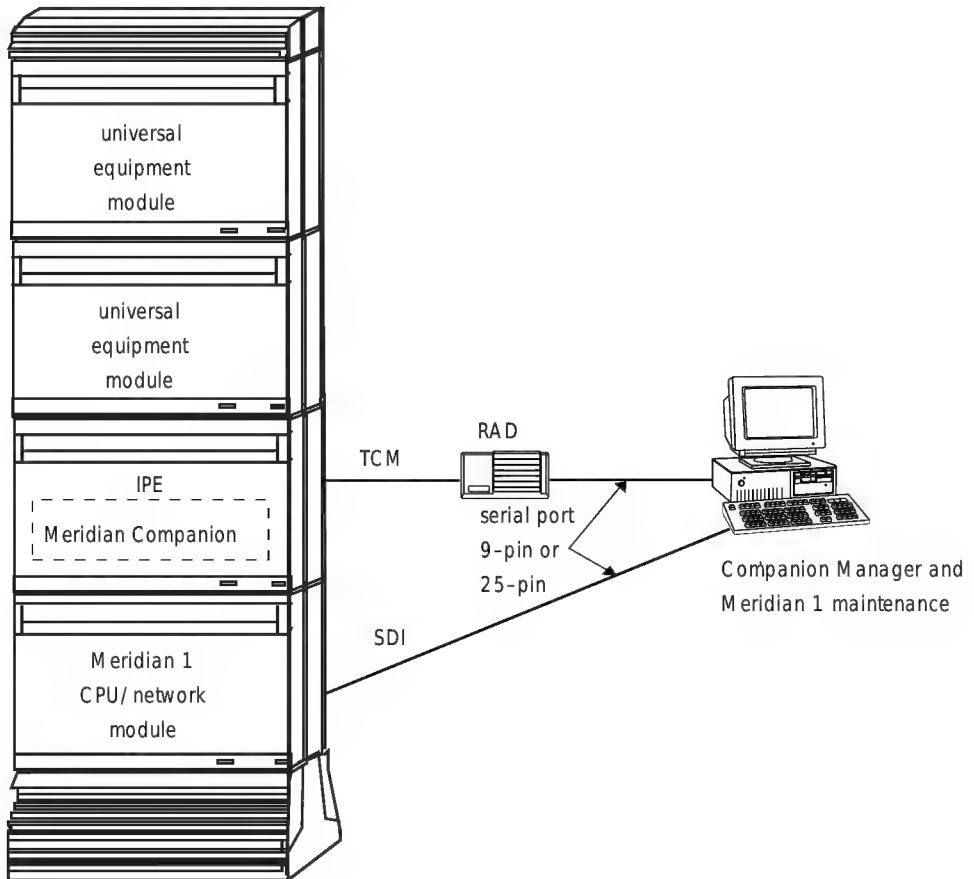
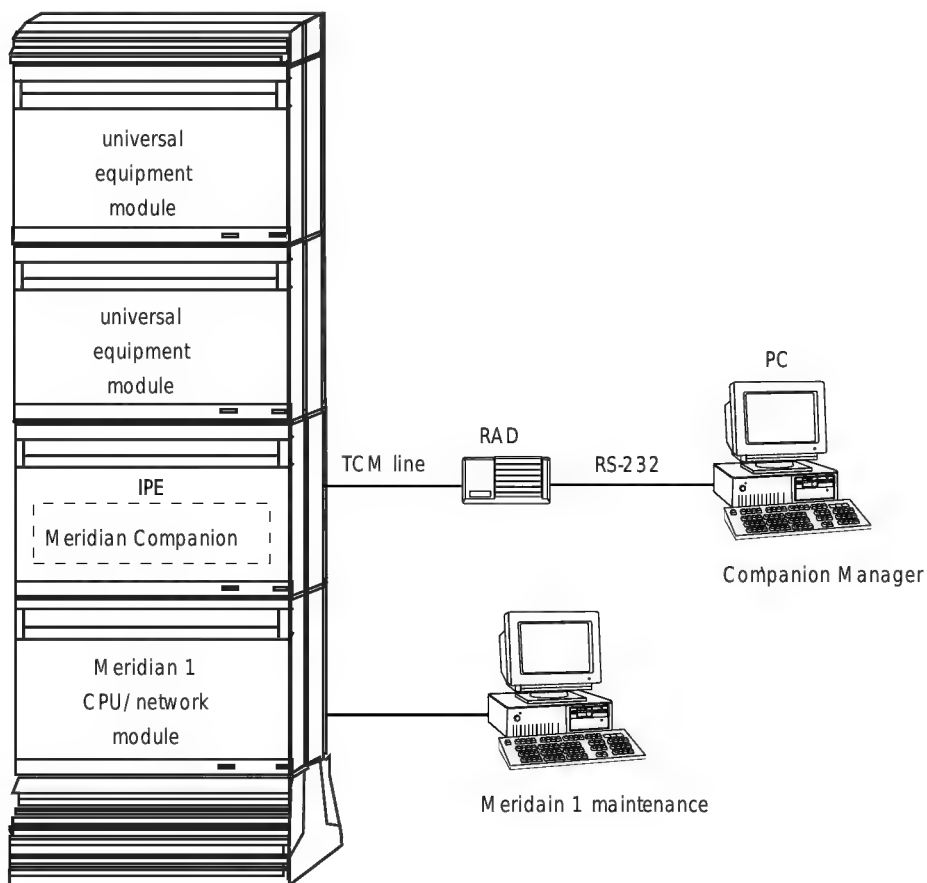


Figure 22 shows local access to Meridian Companion using a PC dedicated to Meridian Companion. In this case, the PC running the diagnostics connects directly to the RAD.

Figure 22: Local access to dedicated Meridian Companion PC



Wiring the Time Compression Multiplexing lines

The Base Stations, the Administration Terminal, and the RAD connect to the Meridian Companion cards using twisted pairs called Time Compression Multiplexing (TCM) lines.

The 16 TCM lines on the CMCC or Companion Meridian radio line cards (CMRC) are available at the backplane on tip and ring pairs.

Planning the IPE and CE/PE Module wiring

Tables 7 through 13 show the configuration for IPE Modules and IPE slots on CE/PE Modules. Refer to the Meridian 1 system installation procedures for more information.

Table 7: NT8D11 CE/PE Module—Line card pair-terminations with backplane cable expansion

Pair	Pins	Pair color	I/O panel connector cables/slots										Unit 24/card
			A	B	C	D	E	F	G	H	K	L	
			0	1	2	3	4	5	6	7	8	9	
1T / 1R	26 / 1	W-BL / BL-W											0
2T / 2R	27 / 2	W-O / O-W											1
3T / 3R	28 / 3	W-G / G-W											2
4T / 4R	29 / 4	W-BR / BR-W											3
5T / 5R	30 / 5	W-S / S-W											4
6T / 6R	31 / 6	R-BL / BL-R											5
7T / 7R	32 / 7	R-O / O-R											6
8T / 8R	33 / 8	R-G / G-R											7
9T / 9R	34 / 9	R-BR / BR-R											8
10T / 10R	35 / 10	R-S / S-R											9
11T / 11R	36 / 11	BK-BL / BL-BK											10
12T / 12R	37 / 12	BK-O / O-BK											11
13T / 13R	38 / 13	BK-G / G-BK											12
14T / 14R	39 / 14	BK-BR / BR-BK											13
15T / 15R	40 / 15	BK-S / S-BK											14
16T / 16R	41 / 16	Y-BL / BL-Y											15
17T / 17R	42 / 17	Y-O / O-Y											16
18T / 18R	43 / 18	Y-G / G-Y											17
19T / 19R	44 / 19	Y-BR / BR-Y											18
20T / 20R	45 / 20	Y-S / S-Y											19
21T / 21R	46 / 21	V-BL / BL-V											20
22T / 22R	47 / 22	V-O / O-V											21
23T / 23R	48 / 23	V-G / G-V											22
24T / 24R	49 / 24	V-BR / BR-V											23
25T / 25R	50 / 25	V-S / S-V											Spare

Table 8:NTAK 11 and NTAK 12 series main and expansion cabinet wiring

Pair	Pins	Pair color	J1	J2	J3	J4	J5	J6	J7	J8	J9	J10	Unit 24/ card	
			J11	J12	J13	J14	J15	J16	J17	J18	J19	J20		
			slot											
			1/ 11/21	2/ 12/22	3/ 13/23	4/ 14/24	5/ 15/25	6/ 16/26	7/ 17/27	8/ 18/28	9/ 19/29	10/ 20/30		
1T / 1R	26 / 1	W-BL / BL-W											0	
2T / 2R	27 / 2	W-O / O-W											1	
3T / 3R	28 / 3	W-G / G-W											2	
4T / 4R	29 / 4	W-BR / BR-W											3	
5T / 5R	30 / 5	W-S / S-W											4	
6T / 6R	31 / 6	R-BL / BL-R											5	
7T / 7R	32 / 7	R-O / O-R											6	
8T / 8R	33 / 8	R-G / G-R											7	
9T / 9R	34 / 9	R-BR / BR-R											8	
10T / 10R	35 / 10	R-S / S-R											9	
11T / 11R	36 / 11	BK-BL / BL-BK											10	
12T / 12R	37 / 12	BK-O / O-BK											11	
13T / 13R	38 / 13	BK-G / G-BK											12	
14T / 14R	39 / 14	BK-BR / BR-BK											13	
15T / 15R	40 / 15	BK-S / S-BK											14	
16T / 16R	41 / 16	Y-BL / BL-Y											15	
17T / 17R	42 / 17	Y-O / O-Y											16	
18T / 18R	43 / 18	Y-G / G-Y											17	
19T / 19R	44 / 19	Y-BR / BR-Y											18	
20T / 20R	45 / 20	Y-S / S-Y											19	
21T / 21R	46 / 21	V-BL / BL-V											20	
22T / 22R	47 / 22	V-O / O-V											21	
23T / 23R	48 / 23	V-G / G-V											22	
24T / 24R	49 / 24	V-BR / BR-V											23	
25T / 25R	50 / 25	V-S / S-V											Spare	

Table 9: NT8D37 IPE Module—Line card pair-terminations with backplane cable expansion, segments 0 and 1

Pair	Pins	Pair color	I/O panel connector cables/slots								Unit 24/card
			A	B	C	D	E	F	G	H	
			0	1	2	3	4	5	6	7	
1T / 1R	26 / 1	W-BL / BL-W									0
2T / 2R	27 / 2	W-O / O-W									1
3T / 3R	28 / 3	W-G / G-W									2
4T / 4R	29 / 4	W-BR / BR-W									3
5T / 5R	30 / 5	W-S / S-W									4
6T / 6R	31 / 6	R-BL / BL-R									5
7T / 7R	32 / 7	R-O / O-R									6
8T / 8R	33 / 8	R-G / G-R									7
9T / 9R	34 / 9	R-BR / BR-R									8
10T / 10R	35 / 10	R-S / S-R									9
11T / 11R	36 / 11	BK-BL / BL-BK									10
12T / 12R	37 / 12	BK-O / O-BK									11
13T / 13R	38 / 13	BK-G / G-BK									12
14T / 14R	39 / 14	BK-BR / BR-BK									13
15T / 15R	40 / 15	BK-S / S-BK									14
16T / 16R	41 / 16	Y-BL / BL-Y									15
17T / 17R	42 / 17	Y-O / O-Y									16
18T / 18R	43 / 18	Y-G / G-Y									17
19T / 19R	44 / 19	Y-BR / BR-Y									18
20T / 20R	45 / 20	Y-S / S-Y									19
21T / 21R	46 / 21	V-BL / BL-V									20
22T / 22R	47 / 22	V-O / O-V									21
23T / 23R	48 / 23	V-G / G-V									22
24T / 24R	49 / 24	V-BR / BR-V									23
25T / 25R	50 / 25	V-S / S-V									Spare

Table 10: NT8D11 CE/PE Module—Line card pair-terminations for connectors A, B, E, H (standard)

Pair	Pins	Pair color	I/O panel connectors/slot				Unit 16/card
			A	B	E	H	
			slot 0	slot 1	slot 4	slot 7	
1T / 1R	26 / 1	W-BL / BL-W					0
2T / 2R	27 / 2	W-O / O-W					1
3T / 3R	28 / 3	W-G / G-W					2
4T / 4R	29 / 4	W-BR / BR-W					3
5T / 5R	30 / 5	W-S / S-W					4
6T / 6R	31 / 6	R-BL / BL-R					5
7T / 7R	32 / 7	R-O / O-R					6
8T / 8R	33 / 8	R-G / G-R					7
9T / 9R	34 / 9	R-BR / BR-R					8
10T / 10R	35 / 10	R-S / S-R					9
11T / 11R	36 / 11	BK-BL / BL-BK					10
12T / 12R	37 / 12	BK-O / O-BK					11
13T / 13R	38 / 13	BK-G / G-BK					12
14T / 14R	39 / 14	BK-BR / BR-BK					13
15T / 15R	40 / 15	BK-S / S-BK					14
16T / 16R	41 / 16	Y-BL / BL-Y					15
				slot 2	slot 5	slot 8	
17T / 17R	42 / 17	Y-O / O-Y					0
18T / 18R	43 / 18	Y-G / G-Y					1
19T / 19R	44 / 19	Y-BR / BR-Y					2
20T / 20R	45 / 20	Y-S / S-Y					3
21T / 21R	46 / 21	V-BL / BL-V					4
22T / 22R	47 / 22	V-O / O-V					5
23T / 23R	48 / 23	V-G / G-V					6
24T / 24R	49 / 24	V-BR / BR-V					7
25T / 25R	50 / 25	V-S / S-V					Spare

Table 11: NT8D11 CE/PE Module—Line card pair-terminations for connectors C, F, K (standard)

Pair	Pins	Pair color	I/O panel connector/slot			Unit 16 per card
			C	F	K	
			slot 2	slot 5	slot 8	
1T / 1R	26 / 1	W-BL / BL-W				8
2T / 2R	27 / 2	W-O / O-W				9
3T / 3R	28 / 3	W-G / G-W				10
4T / 4R	29 / 4	W-BR / BR-W				11
5T / 5R	30 / 5	W-S / S-W				12
6T / 6R	31 / 6	R-BL / BL-R				13
7T / 7R	32 / 7	R-O / O-R				14
8T / 8R	33 / 8	R-G / G-R				15
			slot 3	slot 6	slot 9	
9T / 9R	34 / 9	R-BR / BR-R				0
10T / 10R	35 / 10	R-S / S-R				1
11T / 11R	36 / 11	BK-BL / BL-BK				2
12T / 12R	37 / 12	BK-O / O-BK				3
13T / 13R	38 / 13	BK-G / G-BK				4
14T / 14R	39 / 14	BK-BR / BR-BK				5
15T / 15R	40 / 15	BK-S / S-BK				6
16T / 16R	41 / 16	Y-BL / BL-Y				7
17T / 17R	42 / 17	Y-O / O-Y				8
18T / 18R	43 / 18	Y-G / G-Y				9
19T / 19R	44 / 19	Y-BR / BR-Y				10
20T / 20R	45 / 20	Y-S / S-Y				11
21T / 21R	46 / 21	V-BL / BL-V				12
22T / 22R	47 / 22	V-O / O-V				13
23T / 23R	48 / 23	V-G / G-V				14
24T / 24R	49 / 24	V-BR / BR-V				15
25T / 25R	50 / 25	V-S / S-V				Spare

Table 12: NT8D37 IPE Module—Line card pair-terminations for connectors B, F, L, S

Pair	Pins	Pair color	I/O panel connectors				Unit 16/card
			B	F	L	S	
			slot 1	slot 5	slot 9	slot 13	
1T / 1R	26 / 1	W-BL / BL-W					0
2T / 2R	27 / 2	W-O / O-W					1
3T / 3R	28 / 3	W-G / G-W					2
4T / 4R	29 / 4	W-BR / BR-W					3
5T / 5R	30 / 5	W-S / S-W					4
6T / 6R	31 / 6	R-BL / BL-R					5
7T / 7R	32 / 7	R-O / O-R					6
8T / 8R	33 / 8	R-G / G-R					7
9T / 9R	34 / 9	R-BR / BR-R					8
10T / 10R	35 / 10	R-S / S-R					9
11T / 11R	36 / 11	BK-BL / BL-BK					10
12T / 12R	37 / 12	BK-O / O-BK					11
13T / 13R	38 / 13	BK-G / G-BK					12
14T / 14R	39 / 14	BK-BR / BR-BK					13
15T / 15R	40 / 15	BK-S / S-BK					14
16T / 16R	41 / 16	Y-BL / BL-Y					15
			slot 2	slot 6	slot 10	slot 14	
17T / 17R	42 / 17	Y-O / O-Y					0
18T / 18R	43 / 18	Y-G / G-Y					1
19T / 19R	44 / 19	Y-BR / BR-Y					2
20T / 20R	45 / 20	Y-S / S-Y					3
21T / 21R	46 / 21	V-BL / BL-V					4
22T / 22R	47 / 22	V-O / O-V					5
23T / 23R	48 / 23	V-G / G-V					6
24T / 24R	49 / 24	V-BR / BR-V					7
25T / 25R	50 / 25	V-S / S-V					Spare

Table 13: NT8D37 IPE Module—Line card pair-terminations for connectors C, G, M, T

Pair	Pins	Pair color	I/O panel connectors				Unit 16/card
			C	G	M	T	
			slot 2	slot 6	slot 10	slot 14	
1T / 1R	26 / 1	W-BL / BL-W					8
2T / 2R	27 / 2	W-O / O-W					9
3T / 3R	28 / 3	W-G / G-W					10
4T / 4R	29 / 4	W-BR / BR-W					11
5T / 5R	30 / 5	W-S / S-W					12
6T / 6R	31 / 6	R-BL / BL-R					13
7T / 7R	32 / 7	R-O / O-R					14
8T / 8R	33 / 8	R-G / G-R					15
			slot 3	slot 7	slot 11	slot 15	
9T / 9R	34 / 9	R-BR / BR-R					0
10T / 10R	35 / 10	R-S / S-R					1
11T / 11R	36 / 11	BK-BL / BL-BK					2
12T / 12R	37 / 12	BK-O / O-BK					3
13T / 13R	38 / 13	BK-G / G-BK					4
14T / 14R	39 / 14	BK-BR / BR-BK					5
15T / 15R	40 / 15	BK-S / S-BK					6
16T / 16R	41 / 16	Y-BL / BL-Y					7
17T / 17R	42 / 17	Y-O / O-Y					8
18T / 18R	43 / 18	Y-G / G-Y					9
19T / 19R	44 / 19	Y-BR / BR-Y					10
20T / 20R	45 / 20	Y-S / S-Y					11
21T / 21R	46 / 21	V-BL / BL-V					12
22T / 22R	47 / 22	V-O / O-V					13
23T / 23R	48 / 23	V-G / G-V					14
24T / 24R	49 / 24	V-BR / BR-V					15
25T / 25R	50 / 25	V-S / S-V					Spare

Installing Meridian Companion cards



STATIC!

Wear a grounding strap.

Do not touch the printed circuit board or the connector. The printed circuit board is a static-sensitive device.

Meridian Companion includes four different types of cards:

- a required Companion Meridian Controller card (CMCC)
- optional Companion Meridian radio line cards (CMRC)
- optional Companion Meridian line cards (CMLC)
- a required ROM feature card, which is a daughter board of the Controller card (CMCC)

If a new IPE Module is required, make sure that it has been installed and powered up before installing the Meridian Companion system.

Keep these points in mind when installing cards:

- The cards must all reside on a single IPE Module.
- The cards must be grouped in adjacent slots on the IPE Module (or IPE slots on the CE/PE Module).
- The CMCC can be installed anywhere on the IPE Module, but it must be located to the left of the other Companion cards.
- Any Companion expansion cards must be installed, in any order, to the right of the CMCC, and must be installed before installing the CMCC.
- The cards should be installed and connected from right to left. The CMCC is the last card to be installed and connected.

- When installing cards into an Option 11 core or expansion cabinet, note the actual slot location of the CMCC. You will need to verify this location when programming the system (see “CMCC slot” on page 78 for more information).

ATTENTION!

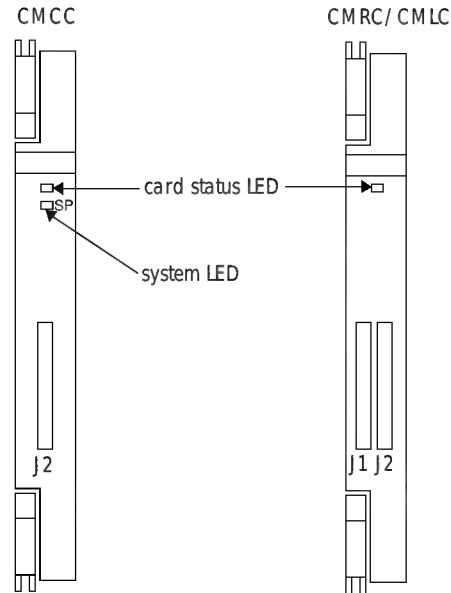
If the card slot address requires an adjustment and you do not make this adjustment, the WTN addresses will not be consistent with the M1 addresses.

Faceplate 60-wire cabling connects the CMCC to the other cards in a daisychain. A long faceplate cable (bypass faceplate cable harness) is available to connect cards across the NT8D01 Controller card if necessary.

Normal LED behavior upon installation

All Companion cards are equipped with a card status LED. The CMCC is also equipped with a system LED, labelled SP (system processor).

The card LED is the top LED on the CMCC and the only LED on the expansion cards. It is not labeled on any cards. If the LED is on, the card is out of service and can be safely removed. If the LED is off, the card is in service and should not be removed. The difference between a regular line card and a Meridian Companion card is that the Meridian Companion card must be disabled from *both the Meridian 1 and the Meridian Companion sides* before the LED goes from *off* to *on*. Conversely, for a completely disabled card (LED is on) the LED goes off instantly when the card is enabled from either side.

Figure 23: Card LED locations

When the card is first installed or powered up, the LED goes on for approximately 3 seconds, then flashes three times to indicate that the firmware self-test sequence is operating properly. If the LED does not follow this pattern, the card is defective and must be replaced.

The system LED is the bottom LED on the CMCC. It indicates the status of the Controller software. Its state affects the state of all other cards. When the CMCC is first installed, the system LED does the following:

- Does not flash but remains on for approximately 5 seconds.
- Goes off for approximately 5 seconds.
- Begins flashing to indicate that connected cards and TCM devices are initializing.

If this normal pattern (on/off/flashing) does not occur, refer to “Troubleshooting a remote power interconnect unit” on page 166. LED behavior following initialization depends on whether the CMCC has been programmed and whether expansion cards have been connected, as described in Table 29 on page 163.

Placing the cards

Figure 24 shows how cards appear on the IPE Module in Option 21 through Option 81 systems.

Figure 24: IPE Module—Meridian Companion possible placement of cards

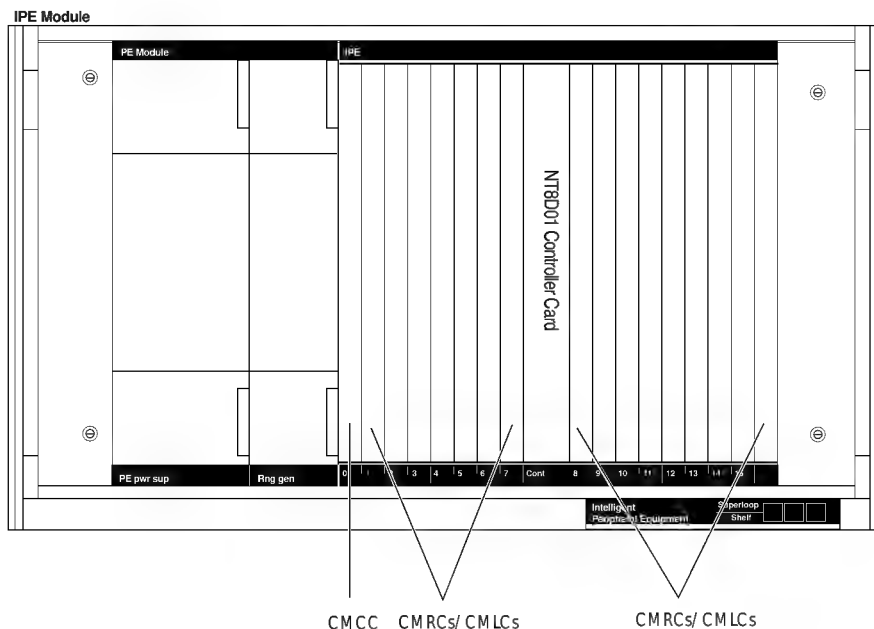


Figure 25 shows the card configuration on a CE/PE Module. The illustration lists other cards that can be located on the CE/PE Module.

Figure 25: CE/PE Module—Meridian Companion possible placement of cards

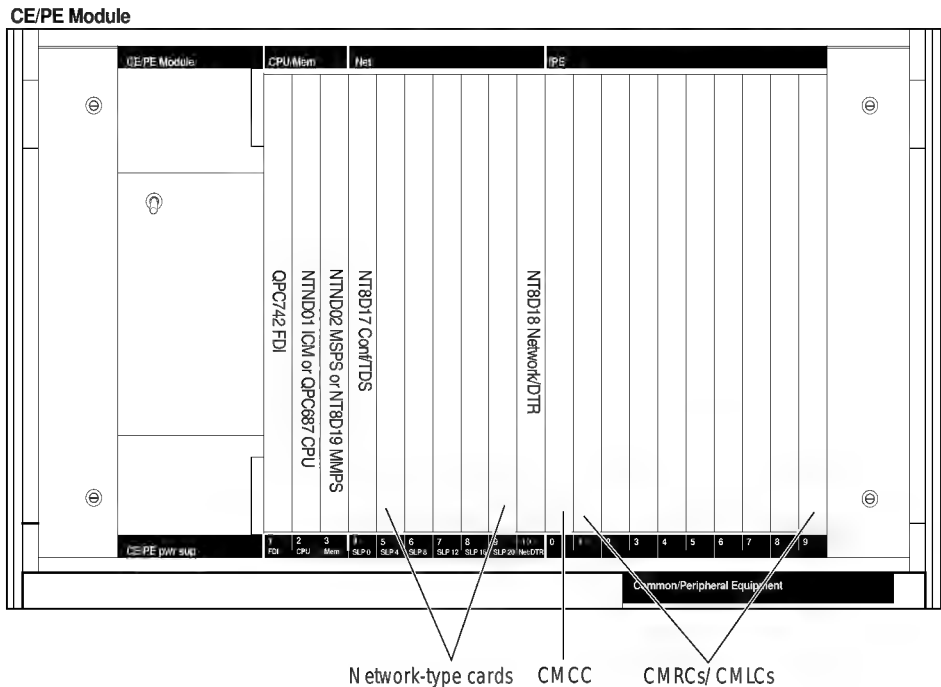


Figure 26 and Figure 27 show card placement in Option 11 systems. The cards can be placed in slots 1 through 9 on the system shelf, as shown in Figure 26, or in an expansion cabinet, as shown in Figure 27. Option 11 systems that are not using Meridian Mail can also install a Companion card in slot 10. The illustrations indicate the kinds of cards that can be included in the Option 11 system.

Figure 26: Option 11 Meridian Companion card configuration—Main cabinet

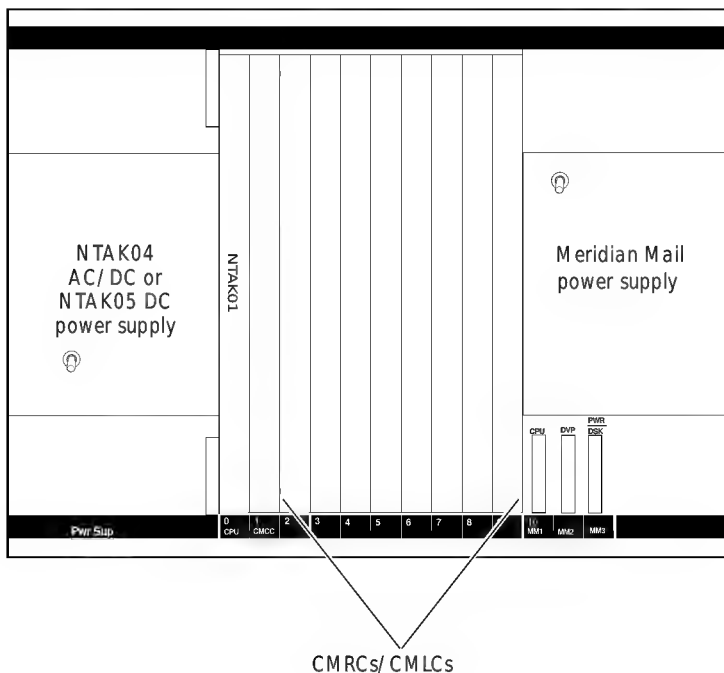
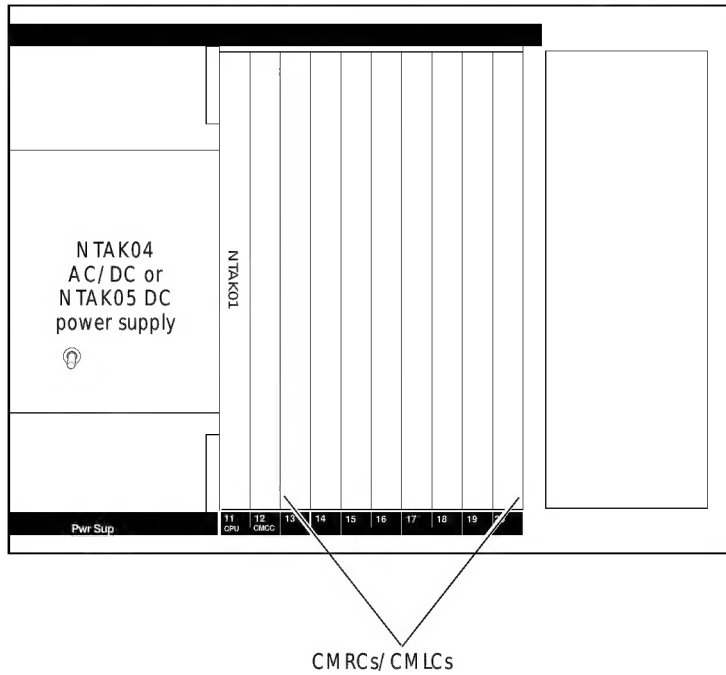
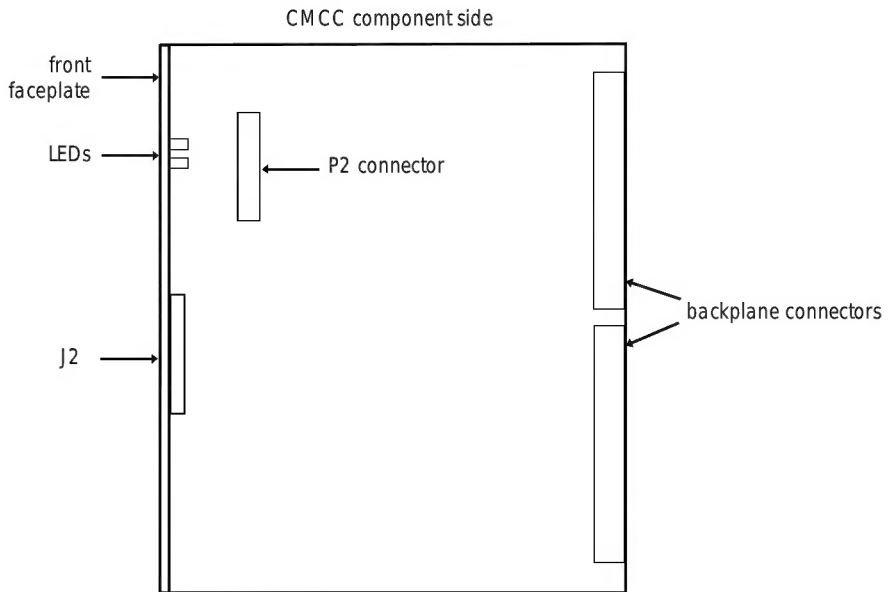


Figure 27: Option 11 Meridian Companion card configuration—Expansion cabinet

Installing the cards

1. Install all expansion cards for your system first. If you are not using expansion cards, proceed to step 3. Verify appropriate card LED behavior, as described in “Normal LED behavior upon installation” on page 56.
2. Connect each card with the adjacent cards, moving from *right to left*, using the interboard faceplate cable harness and the bypass faceplate cable harness, for IPE shelves only. (Both are 60-wire faceplate cables. The bypass cable is an extra long cable used on Option 51 through Option 81 IPE shelves to connect cards across the NT8D01 Controller Card.)
 - a. Make sure the red wire is at the bottom of the cable. (The cable is polarized to guard against incorrect insertion.)
 - b. Insert the J2 (right) cable plug into connector J1 (left) on the card on the far right.
 - c. Insert the J1 (left) cable plug into connector J2 (right) of the next card.
 - d. Insert the J2 plug of the next cable harness into connector J1 of the next card.
 - e. Use a blunt object to press the cable plug and then close the connector latches securely. Do not use the latches to press the cable plug.
 - f. Continue inserting cables from right to left, joining the J1 plug of one line card with the J2 connector of the next line card, until the daisychain reaches the CMCC on the left most card.
 - g. Leave the last faceplate cable hanging for CMCC installation.
3. Insert the two plastic ROM card standoffs into the CMCC holes that are aligned with the ROM card holes.
4. Slide the ROM card into the right-angled connector mate P2 on the CMCC.

Figure 28: P2 plug location

5. Fasten the ROM card securely to the standoffs.
6. Install the CMCC on the IPE Module. The CMCC must be located to the left of any CMRC or CMLC.
7. Connect the J1 plug of the last faceplate cable to the CMCC and verify appropriate card LED behavior, as described in “Normal LED behavior upon installation” on page 56.

Figure 29 illustrates how the system looks after you have installed cards and interboard faceplate cable harnesses.

Figure 29: Example of cards

